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Description

Novel Construction of a Spinner Key Chain Fob

Related Applications

The present application is a continuation in part of patent application serial no.: 10/425,277 filed April 29, 2003 which is a continuation of provisional patent application serial no.: 60/377,753 filed May 6, 2002.

Technical Field

The present invention relates to a lockable assembly system for a decorative key chain fob containing concentric independently rotating members.

Background of Invention

Decorative spinner key chain fobs comprised of independently rotating concentric components are popular consumer items. Typically, these have been made using watchband spring assemblies to connect the inner and outer components. Such assemblies are weak and tend to break or become displaced upon modest impact. Since key chains are often subjected to sudden jolts during normal use, the traditional construction has a tendency to come apart with great frequency. Consequently, there is a need in the industry for a method of constructing spinner key chain fobs with greater stability against impact.

Summary of Invention

The present invention provides a variety of methods for securely affixing at least one rotating member of a key

chain fob within a key chain housing such that the rotating member or members rotate freely when impacted.

In one aspect of the present invention a method is provided for affixing at least one rotating member having two cavities diametrically opposed on its perimeter edge within a key chain housing the housing having an internal perimeter, an external perimeter, an aperture extending through the internal perimeter to the external perimeter and a center post diametrically opposed to the aperture, the internal perimeter able to receive the at least one rotating member by comprising the steps of inserting the center post into one cavity of the at least one rotating member; and affixing a pin within the aperture such that the pin extends through the key chain housing into the remaining cavity of the at least one rotating member such that when the at least one rotating member is impacted it rotates freely.

In another aspect of the invention a method is provided in which the at least one rotating member has a first cavity and a center post diametrically opposed on its perimeter edge and the housing has an internal perimeter, an external perimeter, an aperture through the internal perimeter to the external perimeter and a second cavity diametrically opposed to the aperture, the internal perimeter being able to receive the at least one rotating member comprising the steps of inserting the center post into the second cavity of the key chain housing; and affixing a pin within the aperture such that the pin extends through the key chain housing into the first cavity of the at least one rotating member such that when the at least one rotating member is impacted, it rotates freely.

In yet another aspect of the invention a method is provided for affixing two rotating members within a key chain housing wherein the housing has an internal perimeter, an external perimeter, an aperture through the internal perimeter to the external perimeter and a center post diametrically opposed to the aperture, the internal perimeter able to receive the two rotating members, a first rotating member having two cavities diametrically opposed on its perimeter edge and a second rotating member having an interior perimeter, an exterior perimeter, two apertures diametrically opposed extending through the interior perimeter to the exterior perimeter, the interior perimeter able to receive the first rotating member comprising the steps of inserting the center post into one aperture of the second rotating member; inserting the center post into one cavity of the first rotating member; and affixing a pin within the key chain housing aperture such that the pin extends through the key chain housing, through said remaining aperture of the second rotating member and into the remaining cavity of the first rotating member such that when the rotating members are impacted, they rotate freely and independently.

In still another aspect of the invention a method is provided for affixing two rotating members within a key chain housing wherein the housing has an internal perimeter, an external perimeter, a first aperture through the internal perimeter to the external perimeter and a first cavity diametrically opposed to the first aperture, the internal perimeter able to receive the two rotating members, a first rotating member having a second cavity and a first center post diametrically opposed on its perimeter edge and a second rotating member having an interior

perimeter, an exterior perimeter, a second aperture extending through the interior perimeter to the exterior perimeter, a third cavity diametrically opposed to the second aperture, a second center post aligned with the third cavity on the exterior perimeter, the interior perimeter able to receive the first rotating member comprising the steps of inserting the second center post in the first cavity; inserting the first center post into the third cavity; and affixing a pin within the key chain housing aperture such that the pin extends through the key chain housing through the second aperture and into the second cavity such that when the rotating members are impacted they rotate freely.

In yet another aspect of the invention a method is provided for affixing two rotating members within a key chain housing; the housing having an internal perimeter, an external perimeter, a first aperture through the internal perimeter to the external perimeter and a first center post diametrically opposed to the first aperture the internal perimeter able to receive the two rotating members, a first rotating member having a perimeter edge and two cavities diametrically opposed on the perimeter edge and a second rotating member having an interior perimeter, an exterior perimeter, a second aperture extending through said interior perimeter to the exterior perimeter, a second center post diametrically opposed to the aperture on the interior perimeter, and two cavities diametrically opposed to one another and at an acute angle to the second aperture, the interior perimeter able to receive the first rotating member by comprising the steps of inserting the second center post into one cavity of the first rotating member; affixing a first pin through the second aperture

extending into the remaining cavity of the first rotating member; inserting the first center post into one cavity of the second rotating member; and affixing a second pin through the first aperture extending into the remaining cavity of the second rotating member such that when the rotating members are impacted, they rotate freely.

In one embodiment of the invention affixing the pin within the key chain housing is by press-fit or screw threads. In other embodiments bushings are positioned on the center posts and/or the pins between the rotating members and/or the rotating members and the housing.

Description of the Figures

Figure 1: Is a diagrammatic representation of a spinner key chain fob with a single rotating member, showing (A) a front view of spinner key chain fob with two cavities in the rotating member and (B) a front view of spinner key chain fob with one cavity in and one center post on the rotating member.

Figure 2: Is a diagrammatic representation of a spinner key chain fob with multiple rotating members showing (A) a front view of spinner key chain fob with two cavities in the rotating member and (B) a front view of spinner key chain fob with one cavity in and one center post on the central rotating member and bushings.

Figure 3: Is a diagrammatic exploded representation of a spinner key chain fob with multiple rotating members at acute angles to one another showing (A) a front view and (B) a perspective view of multiple rotating members with bushings.

Detailed Description

Unless defined otherwise, all terms used herein have the same meanings as are commonly understood by one of skill in the art to which this invention belongs.

The term "affixed" as used herein refers to fastening one element of the invention to another element by a variety of methods known to one skilled in the art such as for example screw threads, press fit or adhesive.

The term "diametrically opposed" as used herein refers to two points along a boundary enclosing an object that lie on the opposite sides of a straight line drawn through the geometric center of the object.

The term "perimeter" as used herein refers to a closed curve bounding a planar area, in particular the vertical edge of an element of the invention such as for example the narrowest dimension boundary of a rotating element.

The present invention provides a variety of methods of securely affixing at least one rotating member of a key chain fob within a key chain housing such that the rotating member or members rotate freely when impacted.

The single rotating member key chain fob may be constructed in a variety of ways based on the methods of the present invention. By way of illustration and not by way of limitation two preferred configurations are provided. In each configuration the rotating member is affixed within the key chain housing by utilizing a center post and pin to securely bracket the rotating member in place and to provide spindles on which the rotating member may freely rotate when impacted.

In one configuration, the key chain housing 12 has an internal perimeter and an external perimeter, an aperture 16 through the internal perimeter to the external perimeter and a center post 24 on its internal perimeter and diametrically opposed to the aperture 16. The rotating member 14 in this configuration is provided with two cavities 22 diametrically opposed on its perimeter edge. The spinner key chain 10 is assembled by inserting the center post 24 of the key chain housing 12 into one of the cavities 22 of the rotating member 14 and affixing the pin 18 in the aperture 16 such that it extends through the key chain housing 12 and into the remaining cavity 22 of the rotating member 14.

In a second configuration the key chain housing 12 has an internal perimeter and an external perimeter, an aperture 16 through the internal perimeter to the external perimeter and a first cavity 22 on its internal perimeter and diametrically opposed to the aperture 16. The rotating member 14 in this configuration is provided with a second cavity 22 and a center post 24 diametrically opposed on its perimeter edge. The spinner key chain 10 is assembled by inserting the center post 24 of the rotating member 14 into the second cavity 22 of the key chain housing 12 and affixing the pin 18 in the aperture 16 such that it extends through the key chain housing 12 and into the first cavity 22 of the rotating member 14.

Correspondingly the device 10 of the present invention may be provided with two or more rotating members 14. When the device 10 comprises two or more rotating members 14, a wide variety of configurations may be prepared using the center post 24 and cavity 22 construction. By way of illustration and not by way of limitation, a spinner key

chain fob comprising two rotating members 14 may be provided in at least four in-line constructions with additional constructions wherein the rotating members 14 rotate at acute angles to the housing and/or each other.

The first of the four in-line constructions provides the inner rotating member 14 with two cavities 22 diametrically opposed to one another along its perimeter edge, the second rotating member 14 having two apertures 16 diametrically opposed to one another and the key chain housing 12 having a center post 24 on its internal perimeter and an aperture 16 diametrically opposed to one another, see Figure 1A. The device 10 is assembled by inserting the center post 24 of the key chain housing 12 into one of the apertures 16 of the second rotating member 14 then inserting the center post 24 of the key chain housing 12 into one of the cavities 22 of the inner rotating member 14 and affixing a pin 18 into and through the aperture 16 of the key chain housing 12, through the remaining aperture 16 of the second rotating member 14 and into the remaining cavity 22 of the inner rotating member 14.

The second construction provides an inner rotating member 14 with a first center post 24 and a first cavity 22 diametrically opposed to one another along its perimeter edge, the second rotating member 14 having a second cavity 22 on its interior perimeter and a second center post 24 on its exterior perimeter and aligned with the second cavity 22 and a first aperture 16 diametrically opposed to the second cavity 22 and the key chain housing 12 having a third cavity 22 on its internal perimeter and a second aperture 16 diametrically opposed to the third cavity 22, see Figure 1B. The device 10 is assembled by inserting the

first center post 24 of the inner rotating member 14 into the second cavity 22 of the second rotating member 14, then inserting the second center post 24 of the second rotating member 14 into the third cavity 22 of the key chain housing 12 and affixing a pin 18 within and through the second aperture 16 of the key chain housing 12, through the first aperture 16 of the second rotating member 14 and into the first cavity 22 of the inner rotating member 14.

The third configuration provides an inner rotating member 14 having a first and second cavities 22 diametrically opposed to one another along its perimeter edge, the second rotating member 14 having a first center post 24 on its interior perimeter and a third cavity 22 on its exterior perimeter and aligned with the first center post 24, and an aperture 16 diametrically opposed to the first center post 24 and the key chain housing 12 having a second center post 24 on its internal perimeter and a second aperture 16 diametrically opposed to one another, see Figure 2A. The device 10 may be assembled by inserting the first center post 24 of the second rotating member 14 into the first cavity 22 of the inner rotating member 14, then inserting the second center post 24 of the key chain housing 12 into the third cavity 22 of the second rotating member 14 and affixing a pin 18 within and through the second aperture 16 of the key chain housing 12, though the first aperture 16 of the second rotating member 14 and into the second cavity 22 of the inner rotating member 14.

The forth configuration provides an inner rotating member 14 having a first pin 18 and a first cavity 22 diametrically opposed to one another along its perimeter edge, a second rotating member 14 having a second cavity 22 on its interior perimeter and a third cavity 22 on its

exterior perimeter and a first aperture 16 diametrically opposed to the second cavity 22, the key chain housing 12 having a second center post 24 on its internal perimeter and a second aperture 16 diametrically opposed to one another see Figure 2B. The device 10 may be assembled by inserting the first center post 24 of the inner rotating member 14 into second cavity 22 of the second rotating member 14, then inserting the second center post 24 of the key chain housing 12 into the third cavity 22 of the second rotating member 14 and affixing a pin 18 within and through the second aperture 16 of the key chain housing 12, through the first aperture 16 of the second rotating member 14 and into the first cavity 22 of the inner rotating member 14.

Another series of configuration constructions can be envisioned when the rotating members 14 are not provided in-line but at acute angles to one another see Figure 3A and 3B. For example, in one configuration the inner rotating member 14 may have a first cavity 22 and a second cavity 22 diametrically opposed to one another along its perimeter edge, the second rotating member 14 may have a first center post 24 on its interior perimeter and a first aperture 16 diametrically opposed to one another and a third and a forth cavity 22 diametrically opposed to one another on its exterior perimeter and at an acute angle to the first center post 24, the key chain housing 12 having a second center post 24 and a second aperture 16 diametrically opposed to the second center post 24. This device 10 may be assembled by inserting the first center post 24 of the second rotating member 14 into the first cavity 22 of the inner rotating member 14, affixing a first pin 18 within and through the first aperture 16 of the second rotating member 14 and into the second cavity 22 of

the inner rotating member 14, inserting the second center post 24 of the key chain housing 12 into the third cavity 22 of the second rotating member 14 and affixing a second pin 18 within and through the first aperture 16 of the key chain housing 12 and into the fourth cavity 22 of the second rotating member 14.

Key Chain Housing

The key chain housing 12 functions as a framework to securely maintain the freely rotating member, or members 14, of the key chain fob in position when the key chain is in use. In this capacity, one skilled in the art would realize that a wide variety of sizes, shapes and dimensions for the key chain housing 12 may be provided based on the desires of the consumer. In fact, the decorative aspects of the key chain housing 12 that affect the size, shape and dimensions are only limited by the imagination of one skilled in the art.

The housing 12 comprises an external perimeter and an internal perimeter, each of which may have its own independent shape. For example, the external perimeter of the key chain housing 12 may be provided in a variety of shapes, such as triangular, square, rectangular, rhombahedral, tetrahedral, round, oval, crescent or any combination of these or other geometric forms. Correspondingly, the key chain housing 12 may have the shape of an animal, a bird, a fish, an animated character such as a cartoon character, any real or imaginary beast, a man made structure such as a building or monument or other shape occurring naturally such as a tree or rock formation.

The internal perimeter forms the boundary that defines the area that receives the rotating member 14. Its primary

function is to provide a sufficient opening to receive the rotating member 14 and to allow the rotating member 14, once in place, to rotate freely about the pin/center post axis. The shape of the internal perimeter may be the same or different from the external perimeter. As an example of different shapes, the key chain housing 12 may have a rectangular external perimeter while the internal perimeter may be circular. Correspondingly, for an example, the external perimeter could be provided in the shape of a fish and the internal perimeter could be oval shaped.

The dimensions of the key chain housing 12 may be primarily a consideration of the design aspect desired by, or pleasing to, the consumer. If for example, the design aspect is a company logo, trademark or symbols, such as numerical or alphabetical, the key chain housing 12 dimensions may be concentrated in two of the three dimensions such as length and width for providing the design while the depth may be primarily for structural integrity. If for example, the design aspect is a geometric shape, such as for example a sphere, cube or pyramid, a figure such as a cartoon character, an object such as a building or an animal such as a dog, a fish or a bird, the key chain housing 12 may utilize all three dimensions for the design.

The size of the key chain housing 12 will be based on the desires of the consumer. For example, if the key chain housing 12 is to be used for storing keys in a pocket, it may be preferable that it be relatively small occupying an area of about 1 square inch to about 4 square inches. Correspondingly, if it is to be used for storing keys in a conspicuous manner to prevent loss or for easy recognition,

a larger size may be desired such as for example occupying an area greater than 4 square inches.

The aperture 16 provides a seat for affixing the pin 18 within the housing 12 to secure the rotating members 14 in place. To perform this function the aperture 16 may provide a means for securing the pin 18 in place, for example, such means may include threading to screw the pin 18 in place, a textured surface for press fitting the pin 18 in place or a porous surface for securing the pin 18 with adhesive. This securing means may be provided over the entire surface of the aperture 16 or merely a portion of the aperture 16 surface. If the means is provided, for example, on 1/2 of the aperture's surface, it may be provided near the external perimeter with the remaining portion of the aperture 16 having no means for securing the pin 18 but providing support about its circumference when affixed in place. The diameter of the aperture 16 is sufficient to accept the pin 18 for securing the rotating members 14 in place. The length of the aperture 16 will depend on the dimensions of the housing 12 being penetrated by the aperture 16. The aperture 16 may be provided in the key chain housing 12 in a variety of ways depending on the material selected for preparing the key chain housing 12, including for example, by drilling or by being form molded into the key chain housing 12 during fabrication.

The key chain housing 12 may be made of various natural or synthetic materials used by those skilled in the art, such as metal, wood, stone, bone, plastic, polymer, or any combinations thereof. Preferably the key chain housing 12 is made of a durable impact resistant material such as metal.

The surfaces of the key chain housing 12 may be provided with a wide variety of finishes such as for example smooth, plated, textured, embossed, etched, carved, painted, stained, jeweled, enameled, coated, or otherwise decorated.

The weight of the key chain housing 12 will depend on the material from which it is made and the desires of the consumer. Preferably, the weight ranges from about 1/4 ounce to about 3 ounces for a smaller spinner key chain fob to greater than 3 ounces for a larger one.

A cavity 22 or center post 24 may be provided in the internal perimeter of the key chain housing 12 depending on the configuration selected. The cavity 22 is provided in the key chain housing 12 to receive a center post 24 when such is utilized on a rotating member 14. When provided, the cavity 22 is positioned across from, and diametrically opposed to, the aperture 16 so that when a rotating member center post 24 is positioned in the cavity 22 a pin 18 may be affixed in the aperture 16 securing the rotating member 14 within the housing 12 such that it may freely rotate upon impact. The diameter of the cavity 22 is generally larger than the diameter of the center post 24 it is to receive and preferably only slightly larger so that the rotating member 14 does not wobble about its axis when rotating. The depth of the cavity 22 will depend on the length of the center post 24 to be received by the cavity 22 and the distance desired between the key chain housing 12 and the rotating member 14. In particular the depth of the cavity 22 must not exceed the length of the center post 24 that it is to receive. Preferably the depth of the cavity 22 is slightly less than the length of the center post 24 to allow the rotating member 14 to rotate freely.

For example, the depth of the cavity 22 might be 1/8 inch while the length of the center post 24 that it receives might be 6/32 or 3/16 inch. Correspondingly, if one desires to visually see the center post 24, the cavity 22 could be 1/8 inch in depth while the length of the center post 24 it receives could be 1/2 inch. The surface of the cavity 22 is preferably smooth to reduce the friction the center post 24 might experience during rotation. The cavity 22 may be provided in the key chain housing 12 by a variety of methods including by drilling or by being form molded into the housing 12 during fabrication.

The center post 24 aligns and positions the rotating member 14 within the key chain housing 12 and serves as a spindle or axle about which the rotating member 14 rotates. The center post 24 is preferably cylindrical in shape, having a diameter slightly less than the diameter of the cavity 22 in which it is to be received. The surface of the portion of the center post 24 that is received by the cavity 22 is preferably smooth to reduce friction that might result from the rotation of the rotating member 14. The length of the center post 24 will depend on the desires of the consumer. If the appearance of the center post 24 is desired, such as for example, where the center post 24 is part of the design aspect of the key chain housing 12 it may be desirable to have a longer and more pronounced center post 24. Correspondingly, if it is desirable to diminish the appearance of the center post 24, a shorter, less obtrusive length might be preferred. The center post 24 may be provided in the key chain housing 12 in a variety of ways such as for example it may be form molded into the housing 12 during fabrication or may be welded in place on the internal perimeter of the housing 12. If the center

post 24 is provided within the key chain housing 12 it is preferably positioned across from, and diametrically opposed to, the aperture 16 to allow the rotating member 14 to be secured within the housing 12 and able to freely rotate when impacted. The center post 24 may be made of a variety of materials known to those skilled in the art but is generally made of metal. Preferably the center post 24 is made of a wear resistant or hardened metal such as steel.

The key chain housing 12 may further comprise an attachment means to connect the key chain fob housing 12 to a key storage element such as a key ring or a key chain comprising a key ring. The attachment means may be provided in a variety of ways known to those skilled in the art such as for example, by being form molded with the key chain housing 12 during fabrication or by being manufactured separately and secured in place on the housing 12. For example, it may be provided as a loop hole in the key chain housing 12 to affix a key ring or chain comprising a key ring or it may be a metal loop soldered onto the key chain housing 12 for affixing a key ring or chain comprising a key ring.

Rotating Member

The rotating member 14 provides a dynamic aspect to the key chain fob 10; it is positioned within the key chain housing 12 and able to rotate freely when impacted. One skilled in the art would recognize that the rotating member 14 may be provided in a variety of shapes and that the selection of the shape is only limited by one's imagination. For example, the rotating member 14 may be triangular, square, rectangular, rhombahedral, tetrahedral,

round, oval, crescent or any combination of these or other geometric forms. Correspondingly, it may have the shape of an animal, such as a cat, a bird, or a fish, an animated or imaginary character such as a cartoon character, a man made structure such as a building or monument, or other shape occurring naturally such as a tree or rock formation. As with the housing 12 the dimensions of the rotating member 14 may be primarily focused on the design aspect desired by or pleasing to the consumer. If, for example, the design aspect is a company logo, trademark or symbols such as numerical or alphabetical, the rotating member 14 dimensions may be concentrated in two of the three dimensions, such as length and width, for providing the design while the depth may be primarily for structural integrity. If, for example, the design aspect is a geometric shape, such as for example, a sphere, cube or pyramid, a figure such as a cartoon character, an object such as a building, or an animal such as a dog, fish or bird; the rotating member 14 may utilize all three dimensions for its design.

The rotating member 14 may have a shape that is similar to the internal perimeter of the key chain housing 12 in which it is to be affixed or it may have a different shape. In either case the rotating member 14 must be able to rotate freely within the key chain housing 12 when impacted. If the shapes are similar, for example both being a square, the internal perimeter of the key chain housing 12 would have a length and width larger than the length and width of the rotating member 14. If for example, the shapes are different, such as the rotating member 14 being triangular and the internal perimeter of the key chain housing 12 being circular, the diameter of the internal

perimeter circle would be larger than the length of one of the sides of the triangular rotating member 14.

The size of the rotating member 14 will depend on the size of the internal perimeter of the key chain housing 12. More particularly, the rotating member 14 must be able to rotate freely once it is positioned within the key chain housing 12.

A variety of configurations based on the methods of this invention may be used to position and securely affix the rotating member 14 within the key chain housing 12. In a single rotating member configuration the rotating member 14 preferably has two cavities 22 diametrically opposed to one another positioned along its perimeter. In this configuration one cavity 22 may receive the center post 24 of the key chain housing 12 and the other may receive the pin 18 affixed within and through the aperture 16 of the key chain housing 12. Alternatively, the rotating member 14 may have a single cavity 22 and a center post 24 diametrically opposed to one another and positioned along its perimeter. In this configuration the cavity 22 of the key chain housing 12 receives the center post 24 of the rotating member 14 and the cavity 22 of the rotating member 14 receives the pin 18 affixed within and through the aperture 16 of the key chain housing 12.

Correspondingly, in a multiple rotating member configuration, members positioned between the key chain housing 12 and inner rotating member 14 may be secured within the key chain housing 12 by a wide variety of configurations using center post 24 and cavity 22 constructions. For example, if the spinner key chain 10 is provided with two rotating members, the inner rotating member 14 may be provided as discussed above. The second

rotating member 14 positioned between the inner rotating member 14 and the key chain housing 12 may be provided with a variety of configurations including cavities and/or center posts 24 and/or apertures 16 positioned on either or both the interior or exterior perimeters. For example, the second rotating member 14 may be provided with two apertures 16 diametrically opposed to one another, or it may have an aperture 16 and a cavity 22 on its interior perimeter diametrically opposed to the aperture 16 and a center post 24 on its exterior perimeter and aligned with the cavity 22, or it may have an aperture 16 and a center post 24 on its interior perimeter diametrically opposed to one another and a cavity 22 on its exterior perimeter aligned with the center post 24, or it may have an aperture 16 and a first cavity 22 on its interior perimeter and a second cavity 22 on its exterior perimeter and aligned with the first cavity 22, or it may have a first aperture 16 and a cavity 22 on its exterior perimeter diametrically opposed to one another and a center post 24 on its interior perimeter and aperture 16 diametrically opposed to one another and at an acute angle to the first aperture 16.

The cavities and/or the cavity 22 and center post 24 may be provided on the rotating member 14 in a similar fashion as discussed above for the key chain housing 12. More particularly, the shape, diameter, depth and surface of the cavities and the shape, diameter, length and surface of the center post 24 are similar to that described previously.

The rotating member 14 may be made of a variety of materials including for example metal, wood, plastic, polymer, minerals, stone, bone, or combinations thereof. Preferably the rotating member 14 is made of the same

material as the key chain housing 12. The surfaces of the rotating member 14 may be provided with a wide variety of finishes such as for example, smooth, plated, textured, embossed, carved, painted, stained, jeweled, enameled, coated, or otherwise decorated.

The weight of the rotating member 14 will depend on its size and the material from which it is constructed. Preferably, the weight ranges from about 1/8 ounce to about 2 ounces for a smaller spinner key chain fob to greater than 2 ounces for a larger one.

Pin

The pin 18 serves as a spindle to allow the rotating member 14 to freely rotate about the pin 18 axis and locking means securing the rotating member 14 within the key chain housing 12 when only one rotating member 14 is desired or within another rotating member 14 when more than one rotating member 14 is desired.

The pin 18 is preferably cylindrical in shape and is secured in place through the aperture 16 of the key chain housing 12 or a rotating member 14. The pin 18 may be provided with an affixing means on its exterior surface so that it may be secured within the aperture 16. A variety of affixing means may be utilized with the present invention including providing threads on the surface of the pin 18 to allow the pin 18 to be screwed into place, providing a textured surface for effectively press fitting the pin 18 in place or by providing a porous surface for affixing the pin 18 in place with adhesive. If threading is provided, the pin 18 may also comprise a means for rotating the pin 18 in place, such as for example a standard screw driver slot, a Phillip's screw driver cavity, or a hex wrench

cavity on one end. If the pin 18 is to be press fit into the aperture 16 it may further comprise an indentation on one end of the pin 18 to assist in guiding and driving the pin 18 into the aperture 16.

The affixing means may be provided on the entire length of the pin 18 or just a portion of its length. If the means is provided on a portion of the pins 18 length such as, for example on 1/2 of the pin's 18 surface it is preferably on the portion that interfaces directly with the surface of the aperture 16 when the pin 18 is secured in place. The portion of the pin 18 without the affixing means would preferably be smooth to provide a spindle for rotation and to reduce friction that may result from rotation of the rotating member 14 about the pin 18.

The length of the pin 18 will vary depending on the length of the aperture 16 in the key chain housing 12 and the number of rotating members 14 through which the pin 18 passes. Preferably the pin 18 is not less than the length of the aperture 16 plus about 1/8 inch and not more than 1/2 the distance from the external perimeter of the key chain housing 12 to the center of the rotating member 14. If more than one rotating member 14 is present, then the length of the pin 18 is not less than the length of the aperture 16 plus about 1/8 inch and not more than 1/2 the distance from the external perimeter of the key chain housing 12 to the inner rotating member 14.

The pin 18 may be made of a variety of materials known to those skilled in the art but is generally made of metal. Preferably the center post 24 is made of a wear resistant or hardened metal such as steel.

Bushings

The spinner key chain fob 10 may further comprise bushings 26 to reduce the friction that may be experienced between the rotating members 14 and the key chain housing 12 or between the rotating members 14 and to create a desired spacing between the rotating members 14 and the housing 12 or between the rotating members 14 themselves so that they may rotate freely when impacted.

The bushings 26 are similar to washers having an internal diameter, an external diameter and a width. The internal diameter is based primarily on the diameter of the center post 24 or pin 18 on which the bushing 26 is to be placed. For example, if the diameter of the pin 18 is 1/16 inch the internal diameter of the bushing 26 would be slightly larger enabling it to be placed onto the pin 18 during assembly. The external diameter will depend on the width of the internal perimeter of the key chain housing 12 and the desires of the consumer. Preferably the difference between the internal diameter and the external diameter of the bushing 26 is small to reduce any friction that may be experienced between the rotating members 14 or the key chain housing 12 and the bushing 26. The bushings 26 utilized for a particular spinner key chain fob 10 may have the same dimensions or they may have different dimensions. The selection of bushings 26 may depend primarily on the dimensions of the rotating member 14 and the key chain housing 12. For example, if the rotating member 14 is a pyramid and the key chain housing 12 has an internal perimeter able to receive the pyramid, the bushing 26 used at the top of the pyramid may have a smaller external diameter than the bushing 26 used at the base of the pyramid. The shape of the bushings 26 may vary depending on the ability of the bushing 26 to assist in the rotation of

the rotating members 14 and the desires of the consumer. For example, the bushings 26 may be conical, cylindrical or spherical.

The bushings 26 may be made of a variety of materials known to those skilled in the art, but are generally made of metal. Preferably the bushings 26 are made of a wear resistant or hardened metal such as steel.